

Appl. No. 10/756,740
Amendment dated April 9, 2008
Reply to Office Action mailed January 9, 2008

REMARKS

Claims 1, 5-8, 12, 15-19, 21, 23, 26, 30, 35, 36, 39 and 40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shindo in U.S. Patent No. 5,587,320, in view of the English translations of Kitsui (JP 11300324) and/or Kitsui (JP 2001120460) and further in view of Shimizu (EP 0599661). It is respectfully submitted that the Examiner has not established a *prima facie* case of obviousness with respect to Applicant's claims. Applicant respectfully traverses this rejection.

The Examiner states that Shindo discloses "a treatment apparatus comprising a reactor basin for containing raw material and excrement[.]" Applicant finds no teaching in Shindo that either sawdust or excrement is used in this apparatus. Shindo refers to "a solid organic waste" that is processed, however the only example of a solid organic waste even suggested by Shindo is kitchen garbage. As for sawdust, Shindo states repeatedly that the apparatus purifies and discharges water, making it unnecessary to add water content adjustment material such as sawdust. But nowhere has Applicant found a suggestion that sawdust is added to the apparatus.

One skilled in the art would understand that it would be undesirable to add sawdust to a process that purifies and discharges water. Sawdust absorbs water, and such absorption would make less water available as a product of the process. It would also make the waste harder and drier, reducing the efficacy of the purification process. Thus,

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there is little likelihood of success in adding sawdust to the process of Shindo and no motivation to do so.

Further, the Office Action states that Kitsui indicates that mixing rings are provided for loosening and scraping, and that the helical blade stirrers are divided into two continuous and evenly spaced parts with helical directions that are reverse. These features are not found in either Kitsui reference. Applicant respectfully suggests that the Examiner has failed to point out with specificity what elements of the prior art are being referred to and where in the references these features are found.

None of the references suggests mixing rings on the end of the shaft driving the helical stirring blade. The mixing rings scrape areas of the vessel where the sawdust tends to collect and harden. This makes better use of the sawdust and maintains capacity in the vessel. Since none of the references teaches or demonstrates this principal, no combination of these references would suggest this to one skilled in the art.

Next, it is admitted that the combinations of Shindo and Kitsui still differs from the claimed apparatus because none of the references reveals at least partial overlap of the helical blade stirrers. The Examiner states that Shimizu discloses overlap in mixing blades and that it would have been obvious to modify the helical blade of Shindo and Kitsui in the manner of Shimizu. However, Applicant submits that there is little chance for success in combining these references without significant modification.

Thus, as regards claim 30, both Kitsui and Shimizu show a helical device having a continuous blade that is offset from a rotating axis with a plurality of legs. If two helical devices were positioned as in FIG. 2 of Shimizu and rotated in opposite directions as in Applicant's claims, the helical blades and legs of each helical device would interfere with the rotation of the other helical device. They would not be able to turn in reverse directions. Shimizu is able to operate because there is no continuous blade connecting the pawls, and the rotation can be timed to allow the pawl of one rotating device to sweep through the overlapping area while the pawls of the other rotating device are absent from the overlapping area. If the pawls were connected at the ends with a continuous helical blade, this strategy would no longer work to allow rotation of the devices. Significant modification would be necessary. So, although with hindsight it appears easy to combine the teachings of these references, it is more difficult than it appears and there is little chance of success without modification of the designs shown.

Therefore, several of the features of claims 1, 5-7 and 30 are not taught in the cited references or would not be suggested to one of ordinary skill in the art. Applicant thus maintains that no *prima facie* case of obviousness has been established and that, even if it were, the suggested features are not obvious.

Regarding claim 8, the Examiner has ignored at least six elements of Applicant's claim. Although the Examiner addressed the reactor basin that is covered by

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a top plate having a drop inlet, other claim elements, such as the urinary inlet, spacing of the urinary inlet from the drop inlet, the conduit, arrangement of the conduit at an underside of the top plate, the conduit inlet being in communication with the urinary inlet and the conduit outlet being adjacent to the drop inlet, have not been addressed.

Even if Shindo suggests that materials to be composted are moved through the drop inlet and collected in the reactor basin as alleged by the Examiner, this does not teach or suggest that the drop inlet, urinary inlet and conduit go through the top plate. In Fig. 9, Shindo does show a top plate, but none of the other claimed features are shown to have any relationship with the top plate. The top plate of Shindo covers the drop inlet, it does not have a drop inlet. The waste charge port 25 (or 151) of Shindo would suggest to one skilled in the art that the waste materials should be combined prior to entering the processing vessel. This teaches away from the present invention, and would not suggest to one skilled in the art the features of claim 8. Since at least six elements of this claim have not been identified in the references, no *prima facie* case of obviousness has been established.

With respect to claims 12, 15-19 and 23, these claims feature, among other things, a urinary inlet spaced apart from the drop inlet, a top plate having a drop inlet and a urinary inlet spaced apart from the drop inlet, a heating plate and an insulation layer

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covering the heating plate. Arguments regarding the drop inlet, the top plate and the urinary inlet asserted above are reasserted here.

The Examiner alleges that Shindo teaches the use of an insulation layer. Although this is strictly correct, the insulation layer of Shindo is connected to the auxiliary frame 35, not covering the heating plate as featured in Applicant's claims. Use of an insulation layer in connection with rotary shafts and the auxiliary frame would not suggest the use of an insulating layer for a different purpose, such as with a heating plate. Since at least four elements of the claims are not present, no *prima facie* case of obviousness can be established.

As to claims 21 and 26, the Examiner alleges that the holder for the insulation layer and the use of spring hooks to secure it to the tank are within the description of Shindo. Applicant suggests that this is not correct. Arguments asserted above with respect to the insulation are reasserted here. Since there is no suggestion that the insulation layer of Shindo covers the heating plate or is held by a holder of a temperature control. It is irrelevant that the use of spring hooks are compatible with the design set forth by Shindo. The use of spring hooks to secure the insulation layer to the tank and the support is not suggested to one skilled in the art by the prior art disclosures revealed here.

With respect to claims 35 and 36, these claims feature driving the mixing devices in a reverse direction after one complete rotation. In contrast, Shindo states that the arms are driven forward three sequences, stop, then backward for a predetermined period of time. This reference fails to reveal reversal after only one rotation and would suggest to one skilled in the art that changing direction after only one rotation would lead to insufficient mixing. Arguments asserted above with regard to features absent from claim 30 are reasserted here. Thus, claims 35 and 36 are both novel and non-obvious over the prior art.

Claim 39 depends from claim 36 and further includes the step of driving the mixing devices when a person enters the biotoilet. The Examiner has not suggested that this feature is taught in any of the references. Even if Shindo teaches that the mixing devices are driven when the apparatus comes into use, this could mean that a switch or lever was actuated to begin driving the mixing devices. The reference fails to disclose actuation when a person enters the biotoilet, nor does it suggest automatic actuation when a person approaches the device or anything similar. Thus, this claim should be found to be patentable over the cited documents.

With respect to claim 40, Applicant suggests that nothing in these references would suggest to one skilled in the art to drive the mixing means after the degradation process was completed. Operation of the mixing means in this manner

would waste energy. During cleaning procedures, whirling of the mixer may interfere with steps in the cleaning procedure. No reference to a cleaning procedure was found in the references, making it unlikely that anything would suggest exposing the surfaces of the blades during cleaning.

Claims 24 and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kitsui '324 or Kitsui '460 and Shimizu as applied to claim 23 and further in view of Hudgins (U.S. Patent No. 6,024,513). Arguments asserted above with respect to claim 23 are reasserted here.

Hudgins describes a landfill whereby liquids generated by the biodegradation process are recirculated to the top of the landfill. This is not a means for introducing new waste material into the processing vessel, it takes liquids generated by the partially processed waste and brings it up to the top to moisten the waste mass. In the present process, this is accomplished by operation of the mixing blades.

The passage suggested by the Examiner fails to reveal at least a conduit that is in communication with the urinary inlet, dispensing holes in the bottom of the conduit and an increase in hole diameter toward the outlet. Hudgins only suggests pumping of the leachate through a leachate recirculation system and distribution of the leachate through drip emitters. It would not suggest distribution of urine through a conduit in a biotoilet.

The Examiner further alleges that Hudgins teaches a “system for adding waste material to a fermentation system [.]” This is not correct. Leachate distributed in this reference is not being added to the fermentation system. It is being recycled from the bottom of the fermentation system.

Also, use of the same term “conduit” in both references does not mean that they are the same thing. The Examiner discusses “inclusion of a conduit comprising multiple dispensing holes” in Hudgins. The conduit in Hudgins is connected to a pressurized recirculation system. It does not perform the same function in the same way as Applicant’s conduit, which is in fluid communication with a urinary inlet at ambient conditions. Hudgins does not reveal the use of holes for dispensing the liquid, only drip emitters. Also, Hudgins fails to reveal positioning of the holes on the bottom of the conduit. Since Hudgins’ system is pressurized, it would not rely on gravity for dispensing the fluid, allowing the holes to be anywhere about the circumference of the conduit.

Further, one skilled in the art would recognize that Hudgins teaches application of the recycled liquid to a stationary waste mass in a closed system. New wastes are not being added to this waste mass. Liquids tend to drain away from the waste mass, leaving it dry and hard. Without water in the waste, microbes that digest the waste are deprived of water, oxygen and nutrients, causing them to work less efficiently.

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Recycling of leachate and air injection changes the environment of Hudgins from an anaerobic environment to an aerobic one. One skilled in the art would understand that this is a different environment than that of Shindo. Liquids are recirculated from the bottom of the vessel by the mixing action. There is no motivation for one skilled in the art to look to Hudgins for ways to input new liquid waste to be treated, since Hudgins does not take in new waste.

By the above arguments and amendments, Applicant believes that they have complied with all requirements expressly set forth in the pending Office Action. Issuance of a Notice of Allowance on the remaining allowed claims is respectfully requested. Should the Examiner discover there are remaining issues which may be resolved by a telephone interview, he is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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